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Abstract

PURPOSE: To improve reliability and to reduce irregularities in characteristics by forming an oxide layer as a protective film against a resist developer on an AlN film in a MIS FET having AlN as a gate insulating film on a III-V compound semiconductor substrate.

CONSTITUTION: An n<+> type layer 2 is formed by atomic layer epitaxial growth as a source and drain electrode contact layer on a semi-insulating InP substrate 1. Then, an AlN film 3 is formed as a gate insulating film by an organic metal vapor growing method on the substrate 1. Thereafter, the surface of the film 3 is exposed with an oxygen atmosphere at 100 deg.C., thereby forming a surface oxide film 4 having 50Angstrom of thickness. Subsequently, a photoresist pattern 5 for forming a gate electrode 6 is formed of positive type resist. Then, aluminum is deposited by a resistance heating method on the whole surface of a sample. Thereafter, the pattern 5 is removed to be lifted OFF, and a gate electrode 6 is formed. Then, it can prevent electric characteristics of the AlN and a boundary between the AlN and a semiconductor from being deteriorated with a resist developer.